Answer Key - Quiz 1

International Economics
Monterey Institute of International Studies
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Dr. Robert M. McNab

1. Develop an arithmetic example that illustrates how a nation could have an absolute disadvantage in the production of two goods and could still have a comparative advantage in the production of one of them. (10 Points)

Any example will suffice. For example, assume that constant opportunity costs prevail in a two good, two country environment that is currently in autarky.

	Good 1 (Per Hour of Labor)	Good 2 (Per Hour of Labor)
Country A	100	200
Country B	50	50
	Country A	Country B
MRT Good 1 > Good 2	½	1
MRT Good 2 > Good 1	2	1

Country A has an absolute cost advantage (assuming similar factor input prices) in the production of both goods, however, as illustrated above, Country B is <u>least inefficient</u> in the production of Good 1, that is, if we examine the Marginal Rate of Transformation, we note that the opportunity cost of producing Good 1 is two units of Good 2 for Country A but only one unit of Good 2 for Country B. Thus, Country A has a comparative advantage in the production of Good 2 and Country A has a comparative advantage in the production of Good 1.

2. Discussing constant and increasing opportunity costs (35 Points)

    a. What is meant by constant opportunity costs and increasing opportunity costs? (5 Points)

    Constant opportunity costs imply that the rate of transformation between two goods (or multiple goods if in a multi-good environment) is fixed. In a two-good world, this would imply the production possibilities frontier has constant slope that represents the marginal rate of transformation of one good into another. Note that constant opportunity costs imply the absence of diminishing marginal returns to production.

    Increasing opportunity costs imply that the rate of transformation between two goods (or multiple goods in a multi-good environment) is not fixed. In an increasing opportunity cost environment, the factor inputs are not of

homogenous quality or perfect substitutes, implying, past some point, that the marginal return from successive units of input declines.

b. Under what conditions will a country experience constant or increasing opportunity costs? (10 Points)

A country will experience constant opportunity costs if the factor inputs are perfect substitutes, implying homogenous quality among factor inputs. If factor inputs are not perfect substitutes or of similar quality, then increasing opportunity costs are likely to prevail.

c. How are constant and increasing opportunity costs related to the specialization of a country in the production of a good in which it has a comparative advantage? (10 Points)

In a constant cost environment, the marginal rate of transformation between the two goods (assuming, of course a two-good, two nation environment) does not change. This implies that a country will fully specialize in the production of the good in which it enjoys a comparative advantage.

In an increasing cost environment, the marginal rate of transformation is not constant and as a country specializes in the production of the good in which it enjoys a comparative advantage, it shifts an ever increasing amount of factor inputs out of the production of the other good. At some point, given the imperfect substitutability of factor inputs, the marginal return to successive units of inputs declines, implying that the opportunity cost of the good in which the country enjoys a comparative advantage is increasing. At some point, the opportunity cost rises to the point where further specialization will not occur due to high opportunity costs. Partial specialization typically occurs in the increasing opportunity cost environment.

i. Illustrate the differences between the autarkic production and consumption points under the assumptions of constant and increasing opportunity costs. (5 Points)

Illustrated in class

ii. Illustrate the transition from the autarkic state to the post-trade state under the assumptions of constant and increasing opportunity costs. (5 Points)

Illustrated in class

3. Discussing Marginal Utility, Indifference Curves, Law of Demand (35 Points)

    a. Discuss, in your own words, the relationship between the Law of Diminishing Marginal Utility, Indifference Curves, and the Law of Demand. (15 Points)

One should recall that the Law of Diminishing Marginal Utility, in essence, "drives" the concept of Indifference Curves and the Law of Demand. Recall, the LDMU states, in brief, the more you have (consume) of any good relative to all others, the less value (satisfaction) you place (derive) from purchasing (consuming) additional units of that good. In other words, all else being equal, past some point, additional units of consumption of a good lead to declines in marginal utility.

What does this imply? For indifference curves, the implication is that to hold utility constant, past some point as you shift consumption of one good to another, you must consume ever increasing amounts of the one good to which you are switching consumption to hold utility constant. As you shift consumption away from Good A to Good B, past some point, the Marginal Utility of Good A starts to increase (you are consuming less, thus you derive greater satisfaction from the last unit consumed) and the Marginal Utility of Good B starts to decrease (you are consuming more, thus you derive less satisfaction from the last unit consumed). LDMU implies that Indifference Curves are convex in shape.

Note what this says, as you consume more of any good, relative to all others, the less satisfaction you derive from additional units of the good. If you derive less satisfaction from additional units of consumption, you value on those additional units of consumption declines, that is, you are unwilling to pay the same price as the last unit consumed to consume the next unit. Thus, to induce additional consumption, price must decline, implying a inverse relationship between price and quantity demanded.

    b. Using your answer in (3) as a starting point, discuss how indifference curves are used to determine the autarkic point of consumption and production under the assumption of increasing opportunity costs. (10 Points)

Illustrated in class. However, in the increasing cost environment, the tangency of the highest indifference curve to the production possibilities frontier defines the point of consumption and production in the autarkic state. Why? At that point, the autarkic MRT is equal to the autarkic MRS.

    c. Illustrate, using (3) and (a) as a starting point, the potential gains from trade under the assumption of increasing opportunity costs. Ensure that you use two countries and two goods to illustrate how the terms of trade are achieved, what are the autarkic and post-trade consumption and

production points on the transformation schedule, the direction of trade, and the amount of exports and imports for each country. (10 Points)

Illustrated in class.

4. Supply schedules (20 Points)

    a. Illustrate the differences between supply schedules under the assumptions of constant and increasing opportunity costs. (10 Points)

In the constant cost environment, the supply schedule is horizontal to the X-axis at the relative price of the good on the X-axis to the other good. The supply curve goes vertical at the point where maximum production is achieved given current resources, time, and technology.

In the increasing cost environment, the supply schedule appears much like a normal supply curve, expect relative price in on the vertical axis. Again, the supply curve is vertical at the point of maximum production given current resources, time, and technology.

    b. Using (4) as a starting point, illustrate how a change in productivity would influence the supply schedules of each nation under the assumptions of constant and increasing opportunity costs. (10 Points)

In the constant cost environment, a change in productivity, unless evenly distributed between the two goods, would change the MRT and, in all likelihood, the maximum amount of production. This would mean that the supply schedules vertical intercept (relative price) would shift (most likelihood downward for the good experiencing the productivity improvement) and the point of maximum production would also shift to the right.

In the increasing cost environment, the supply curve would (if it was the good experiencing the productivity improvement) shift down and to the right.

    c. **Bonus**: Using (4) and (4a), illustrate how a change in productivity could change the comparative advantage of each nation from one good to another. Note how the change of productivity influences the opportunity costs in each country and the transformation schedules. (5 Possible Points)

	Good 1 (Per Labor Hour)	Good 2 (Per Labor Hour)
Country A	100	200
Country B	50	50
Country A (Improved)	200	200
Country B (Improved)	100	400

As illustrated above, a change in productivity for each country not only changes the MRT of each country, but changes the comparative advantages of each country. Previously, Country B had a comparative advantage in the production of Good 1, now it has a comparative advantage in the production of Good 2, and vice versa for Country A. One could also illustrate this change using either constant or increasing cost supply schedules.

5. **Bonus**: Discuss, in your own words, how the Laws of Diminishing Marginal Returns and Utility are related to indifference curves and transformation schedules, respectively, and how these observations can result in a linkage between indifference curves and the law of demand and transformation schedules and the law of supply. (10 possible points)

The first part of the bonus question has already been discussed (re LDMU, IC, LOD).

The same chain of logic applies to the Law of Diminishing Marginal Returns, Transformation Schedules, and the Law of Supply. The complete answer will not be included at this time as this question may appear on a later exam.